

Remarks

Applicants respectfully request reconsideration of the present patent application in view of the following remarks. No claims have been amended, added or cancelled. Therefore, claims 1-19 are pending in the present application.

Claims 6 and 7 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Publication No. 2002/0071974 to Yamaoka ("the Yamaoka reference").

Independent claim 6 is directed to a catalytic hydrocarbon reformer for making reformat comprising an electronic control module for controlling the flow of hydrocarbon fuel and air into the reformer. The electronic control module is programmed with a software construct for determining a fuel combustion time interval for pre-heating the hydrocarbon catalytic reformer from a starting temperature to a minimum reforming temperature.

In view of the Examiner's remarks on page 2 of the Final Office Action mailed on January 23, 2008 ("Final Office Action"), Applicants maintain that the Yamaoka reference does not teach or suggest a catalytic hydrocarbon reformer including an electronic control module that is programmed with a software construct for determining a fuel combustion time interval for pre-heating the hydrocarbon catalytic reformer from a starting temperature to a minimum reforming temperature as recited in claim 6. In the Final Office Action, the Examiner acknowledges that the Yamaoka reference does not explicitly disclose calculating a fuel combustion time interval, but instead relies on an implicit teaching therein. See *Final Office Action*, pg. 2, ¶ 3.

It is the Examiner's burden to "make it clear that the missing descriptive matter is necessarily present in the thing described in the prior art reference, and that it would be so recognized by persons of ordinary skill." *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991). "Inherency, however, may not be established by probabilities or possibilities." *Id.* at 1269, 20 USPQ2d at 1749 (quoting *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (C.C.P.A. 1981)). "The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.* Thus, the Examiner must provide some specific evidence or scientific reasoning to establish the reasonableness of the Examiner's belief that a fuel combustion time interval for pre-heating the hydrocarbon catalytic reformer from a starting temperature to a minimum reforming temperature is inherently disclosed in the Yamaoka reference. See *Ex parte Skinner*, 2 USPQ2d 1788, 1789 (B.P.A.I. 1986).

Initially, the Examiner pointed to the Abstract of the Yamaoka reference in order to teach a fuel combustion time interval for pre-heating the hydrocarbon catalytic reformer from a starting temperature to a minimum reforming temperature. See *Final Office Action*, pg. 3, ¶ 6. Applicants previously argued that there is nothing in the Abstract of the Yamaoka reference that discloses that a starting temperature of the reformer and a minimum reforming temperature of the reformer are used in a software construct to determine a fuel combustion time interval for the heating device. See *Amendment and Response mailed on November 9, 2007*, pg. 10.

The Examiner is now looking to the control device recited in the Abstract and the quantity of fuel flow as compared with time, as shown in FIG. 6 of the Yamaoka reference, to implicitly calculate a reforming time using flow rates. See *Final Office Action*, pg. 2, ¶ 3. First, it should be noted that the Examiner's implicit teaching of a reforming time does not even coincide with the language set forth in claim 6. Claim 6 is specifically directed to a fuel combustion time interval for pre-heating a hydrocarbon catalytic reformer, not a reforming time interval. In other words, claim 6 is directed to the amount of time that a reformer is pre-heated using fuel combustion, not the amount of time that reforming takes place.

Second, the two graphs shown in FIG. 6 of the Yamaoka reference do not explicitly or implicitly disclose any fuel combustion time interval for pre-heating a hydrocarbon catalytic reformer. Instead, FIG. 6 merely discloses "a correction value of a quantity of fuel for burning at a transient time when a quantity of raw fuel changes as a step function." *Yamaoka*, pg. 2, ¶ [0023]. It is unreasonable to conclude in view of what is shown in FIG. 6 that the Yamaoka reference necessarily utilizes a fuel combustion time interval for pre-heating the reformer (4) just because the fuel correction value is dependent upon time. Moreover, the fact that the Yamaoka reference could possibly use a fuel combustion time interval for pre-heating the reformer (4) is insufficient to establish a prima facie case of anticipation based on inherency. Again, "[i]nherency . . . may not be established by probabilities or possibilities." *Id.* at 1269, 20 USPQ2d at 1749. "The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.*

Another possible arrangement is for the Yamaoka reference to use a temperature probe that is located in a position that results in a time lag between the actual temperature of the catalytic elements within the reformer (4) and the temperature response of the temperature probe, thereby resulting in a fuel combustion time interval that is longer than required and a reforming catalyst that is warmer than what is required to begin reforming. *See Specification*, pg. 5, line 25 through pg. 6, line 2. Since there is at least one other method in which the reformer (4) in the Yamaoka reference could be preheated, assuming that any preheating exists at all in the Yamaoka reference, Applicants submit that there has been insufficient evidence presented to establish that a fuel combustion time interval for pre-heating the hydrocarbon catalytic reformer from a starting temperature to a minimum reforming temperature is necessarily disclosed in the Yamaoka reference.

For at least the reasons set forth above, Applicants submit that a prima facie case of anticipation has not been established based on the Yamaoka reference. Applicants request that the rejection of claim 6 be withdrawn. As claim 7 depends from claim 6, it is requested that the rejection of claim 7 be withdrawn as well.

Claims 1-5 and 10-19 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2003/0101713 to Dalla Betta ("the Dalla reference") in view of the Yamaoka reference.

Independent claim 1 is directed to a method for pre-heating a hydrocarbon catalytic reformer from a starting temperature to a minimum reforming temperature utilizing an electronic control module, comprising the steps of: a) selecting a fuel type to be combusted; b) determining the latent heat of combustion of the selected

fuel type; c) selecting a flow rate of the combustion fuel; d) determining the heat capacity of the catalyst to be heated in the catalytic reformer; e) determining a mass of the reformer to be heated; f) determining a starting temperature of the catalytic reformer; g) utilizing a software construct to produce the fuel combustion time interval, wherein the construct utilizes the latent heat of combustion, the selected combustion fuel flow rate, the heat capacity of the catalyst, the mass to be heated, and the starting temperature; and h) pre-heating the hydrocarbon catalytic reformer using a combustor for the fuel combustion time interval so that the hydrocarbon catalytic reformer reaches the minimum reforming temperature.

In the Final Office Action, the Examiner states that Applicants argue that " the Dalla Betta reference fails to teach the determination of a fuel combustion time interval." *Final Office Action*, pg. 2, ¶ 4. Applicants would like to point out that the argument with respect to claim 1 is more specific than the Examiner has indicated. In particular, Applicants submit that the combination of the Dalla reference and the Yamaoka reference do not teach or suggest a method for pre-heating a hydrocarbon catalytic reformer comprising the steps of: f) determining a starting temperature of the catalytic reformer; and g) utilizing a software construct to produce the fuel combustion time interval based on, among other factors, the starting temperature of the catalytic reformer as recited in claim 1.

The Examiner acknowledges that the Dalla reference does not explicitly disclose a method that results in the production of a fuel combustion time interval, but instead relies on an implicit teaching in the Dalla reference. *See Final Office Action*, pg. 2, ¶ 4. Therefore, the threshold for establishing a prima facie case of

anticipation based on an inherency theory is the same as set forth above. The Examiner must provide some specific evidence or scientific reasoning to establish the reasonableness of the Examiner's belief that the steps of: f) determining a starting temperature of the catalytic reformer; and g) utilizing a software construct to produce the fuel combustion time interval based on, among other factors, the starting temperature of the catalytic reformer are necessarily disclosed in the combination of the Dalla reference and the Yamaoka reference. See *Ex parte Skinner*, 2 USPQ2d 1788, 1789 (B.P.A.I. 1986).

In the Final Office Action, the Examiner stated that the Dalla reference's "disclosure of calculating the length of time of fuel reforming in rich mode (paragraph 101) does not preclude the significance and ability of [the Dalla reference] to implicitly calculate combustion time." *Final Office Action*, pg. 2, ¶ 4. Whether or not applicants agree with the Examiner's statement, the burden still falls on the Examiner's to show how paragraph [0101] of the Dalla reference necessarily discloses that a starting temperature of the catalytic reformer is used to produce a fuel combustion time interval so that the reformer reaches a minimum reforming temperature. Applicants maintain that the fuel processing referred to in paragraph [0101] is not related to the length of time that the fuel is combusted to heat the reformer (i.e., fuel combustion time interval), but is instead related to the length of time the fuel processor (reformer) is operated in a "rich mode," which relates to a reforming mode. See *Specification*, pg. 1, lines 26-28 (stating that a reformer operates in a fuel rich condition and a combustor operates in a lean fuel to air ratio). In other words, paragraph [0101] does not provide any evidence to conclude that a

starting temperature of the fuel processor (i.e., reformer) is taken into consideration when determining how long to use a combustor to pre-heat the reformer to a minimum reforming temperature.

The Examiner relies on paragraph [0095] of the Dalla reference to show that the amount of fuel that is fed to the reformer is calculated by integrating with respect to time, and therefore calculating time when fuel rate is known would be a known calculation. *See Final Office Action*, pgs. 2-3, ¶ 3. While the above rationale addresses the calculation of time for feeding fuel to a reformer, it does not in any way address the calculation of a fuel combustion time interval during which a combustor operates to pre-heat the reformer to a minimum reforming temperature, as recited in claim 1. Further, the Examiner's rationale also does not address how the alleged time interval for feeding fuel to the reformer in paragraph [0095] relates to the starting temperature of the catalytic reformer. It appears that the Examiner is attempting to correlate an entirely different aspect of the operation of a reforming system compared to what is being set forth in claim 1. The cited portions of the Dalla reference relate to calculating the fuel flow to a reformer, while claim 1 relates to calculating a fuel combustion time interval for a combustor to pre-heat the reformer to a minimum operating temperature. The Examiner also cites paragraph [0093] to support the above position. Applicants submit that paragraph [0093] relates to a nitrogen oxides storage-reduction ("NSR") emission control system, and does not relate to the production of a fuel combustion time interval based on the starting temperature of a reformer. *See also Dalla*, Abstract; FIG. 1.

The Examiner goes on to point out that the rejection of claim 1 is based on the combination of the Dalla reference and the Yamaoka reference, and not the Dalla reference taken alone. Applicants acknowledge the combination of references, and submit that the Yamaoka reference fails to teach or suggest the limitations that were lacking in the Dalla reference for at least the reasons set forth above with respect to claim 6.

For at least the foregoing reasons, Applicants submit that a prima facie case of obviousness has not been established and request that the rejection of claim 1 be withdrawn. As claims 2-5 depend from claim 1, these claims are not taught or suggested by the combination of the Dalla and Yamaoka references for at least the same reasons that were set forth with respect to claim 1.

Since claims 10-19 also include limitations that are similar to those that were argued above with respect to claim 1, Applicants submit that claims 10-19 are not taught or suggested by the combination of the Dalla and Yamaoka references for at least the same reasons that were set forth with respect to claim 1. It is requested that the rejection of claims 10-19 be withdrawn.

Claim 8 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Yamaoka reference in view of the Dalla reference. Since claim 8 depends from claim 6, Applicants submit that the Yamaoka reference fails to teach or suggest all of the limitations included therein for at least the same reasons that were set forth above with respect to claim 6. The Dalla reference also fails to teach or suggest the limitation that was lacking in the Yamaoka reference. It is therefore requested that the rejection of claim 8 be withdrawn.

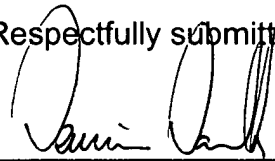
Claim 9 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Yamaoka reference in view of U.S. Patent Publication No. 2002/0150532 to Grieve ("the Grieve reference"). Since claim 8 depends from claim 6, Applicants submit that the Yamaoka reference fails to teach or suggest all of the limitations included therein for at least the same reasons that were set forth above with respect to claim 6. The Grieve reference also fails to teach or suggest the limitation that was lacking in the Yamaoka reference. It is therefore requested that the rejection of claim 8 be withdrawn.

Conclusion

In light of the foregoing, Applicants submit that claims 1-19 are in condition for allowance and such allowance is respectfully requested. Should the Examiner feel that any unresolved issues remain in this case, the undersigned may be contacted at the telephone number listed below to arrange for an issue resolving conference.

Applicants do not believe that any fee is due at this time. However, the Commissioner is hereby authorized to charge any fees that may have been overlooked to Deposit Account No. 10-0223.

Respectfully submitted,



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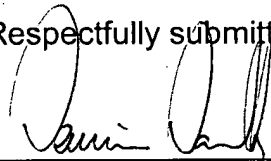
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